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Hanford Double-Shell Tank Tank Integrity Program Update

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Agenda

- Program overview
- Tank Integrity Expert Panel (TIEP)
- Corrosion control program implementation
- Inspections
  - Results
  - Undertank inspection development
- Repair technology development
- Summary and path forward

Double-Shell Tank Integrity Program

- Maintain double-shell tanks (DST) structural integrity to support waste processing operations while maintaining safe storage
- Meet regulatory requirements
- Program elements
  - Corrosion Control
  - Inspections
  - Structural analyses and studies
  - Repair technology development

Visual Inspection Crawler

Tank Integrity Expert Panel

- TIEP provides independent expert guidance and feedback
- The TIEP endorsed the key focus areas of the tank integrity program during its 2019 review
  - Revised chemistry control program to include halide-induced pitting factors
  - Core sampling and specific laboratory studies to respond to potential vertical stratification of chemistry
  - Under-tank visual and volumetric inspection development and deployment has been “excellent”
  - Encouraged the development of repair technologies

Tank Internal Corrosion Control Program Changes

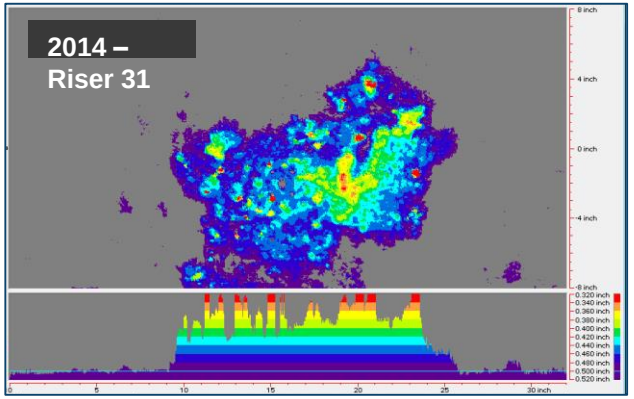
- Proactive program implemented new corrosion control envelope
- Includes a pitting factor as a function of halides (ratio of inhibitor to aggressive species)
- Implemented into operating specification documents
- Core sampling performed on Tanks AY-101 and AN-107
- Corrosion testing on Tank AY-101 sample demonstrated corrosion inhibition

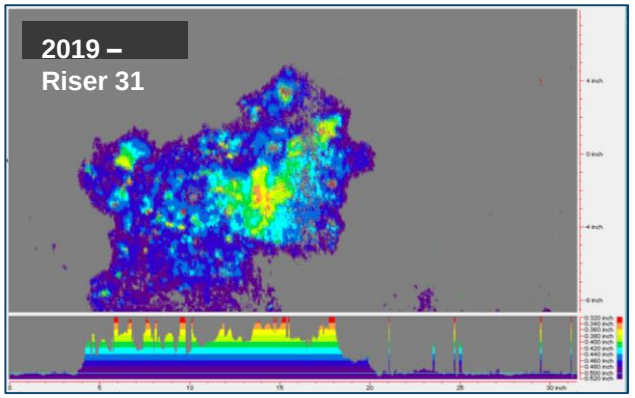
Primary Tank Ultrasonic Inspections

- Primary tanks inspected during fiscal year 2019 showed no evidence of consequential corrosion
- Minimal localized thinning has been found in the annulus floor of some tanks
- Tank AP-102 annulus floor reinspected to determine secondary floor corrosion

Tank AP-102 Annulus Floor Inspection

- Reinspected at half the normal frequency to evaluate the secondary liner condition
- Examined Tank AP-102 secondary liner floor beneath four risers (Risers 30, 31, 60, and 61)
- Deepest measured pitting locations from Riser 31 in 2014 haven't changed, given the fidelity of the inspection



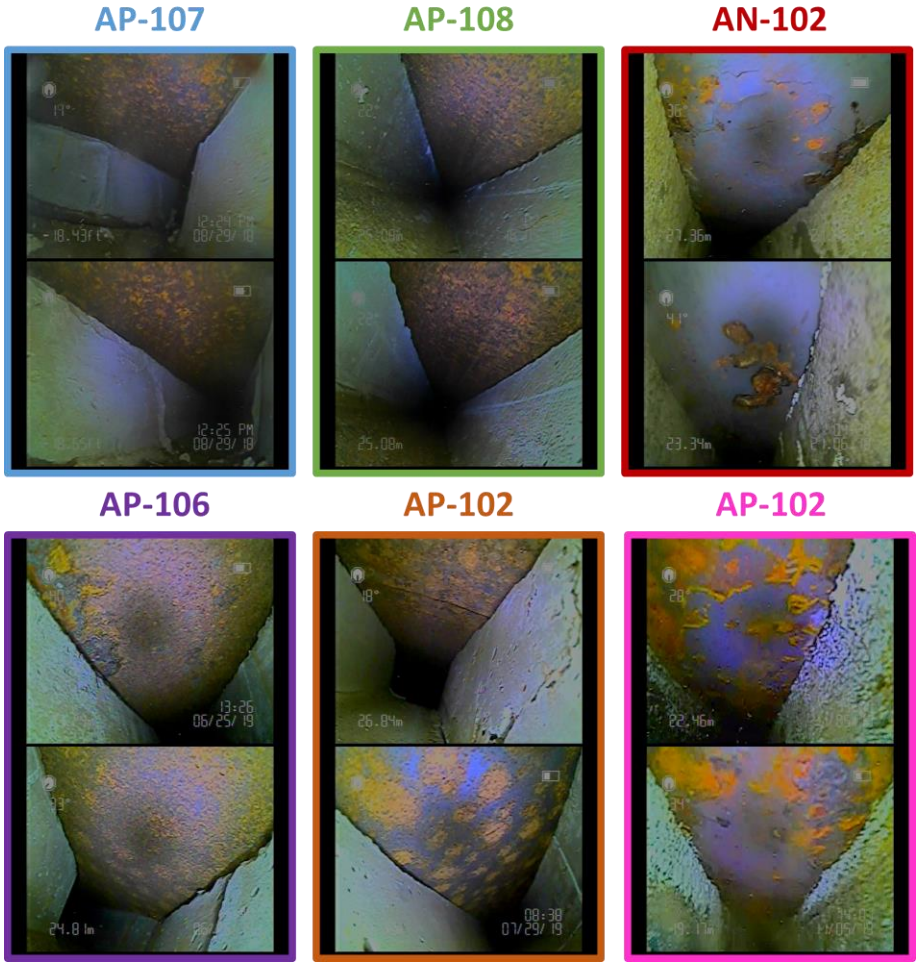


Riser	2019 Area Scanned	2019 Minimum	2014 Minimum
30	~33 ft^2	0.459" (8.2%)	0.486" (2.8%)
31	~25 ft^2	0.142" (71.6%)	0.149" (70.2%)
60	~23 ft^2	0.451" (9.8%)	N/A
61	~13 ft^2	0.415" (17%)	N/A

Under-Tank Visual Inspections

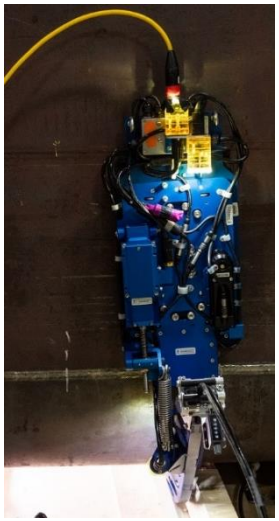
- Tank bottom visual inspection has been incorporated as a programmatic practice since initial demonstration at Tank AP-107
- Has been deployed in Tanks AP-107, AP-108, AN-102, AP-106, AP-102, and AW-102 with great success
- As expected, results show intact metal with evidence of superficial spotty humid air corrosion

Push-Pull arm system attached to existing inspection crawler platform deploys rigid tethered inspection camera with pan/tilt functionality

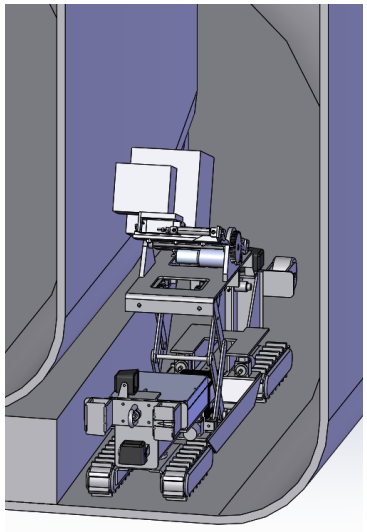


Tank-Bottom Volumetric Inspection Developments

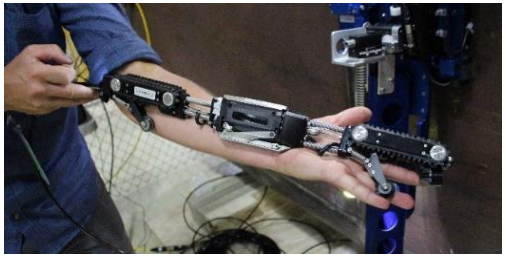
- Development of several tank-bottom volumetric examination sensors and robotic systems has been ongoing to allow further characterization of visual inspection findings
- These inspection sensors and their deployment platforms will be tested and available for field deployment in mid-fiscal year 2020 to early fiscal year 2021



Air Slot Guided Wave UT



Tank Wall Guided Wave UT



Air Slot Conventional UT

Tank Repair Feasibility Study

- Feasibility study in progress to support the selection of applicable technologies for further development (if necessary) and implementation
- Evaluates technology repair approaches for common failures
- Evaluates viability of technologies based on flaw location
- Eleven types of technologies being evaluated

Summary and Path Forward

- The tank integrity program is proactive and robust
- Significant progress has been made in corrosion control, inspections, and repair technology development
- The TIEP has endorsed the progress and continues to guide the program
- The program is dynamic and poised to support the waste processing mission